

**Shell Marine**



# NEXT-GENERATION TRUNK PISTON ENGINE OILS: SHELL ARGINA AND SHELL GADINIA

Protecting engines and keeping the oceans open for business



## AN EVER-CHANGING INDUSTRY



**At Shell Marine, we understand and anticipate the changes that constantly influence our industry, for example, tighter nitrogen oxide (NO<sub>x</sub>) limits and global sulphur caps. As operating costs increase and demand weakens, operational changes can be financially demanding. We work hard to provide integrated lubrication solutions that can help to optimise your operations.**



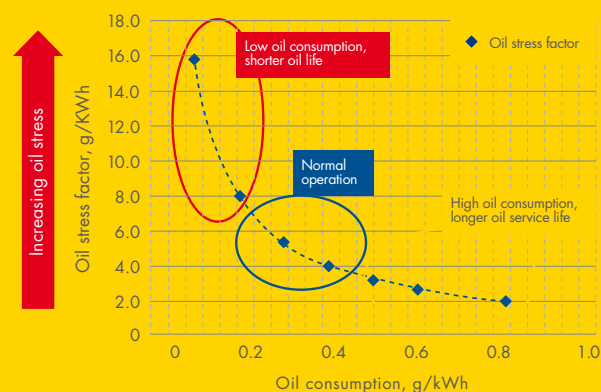
The development of Shell Argina and Shell Gadinia trunk piston engine oils reflects the challenges facing the marine industry; designed to meet the latest engine and fuel requirements, they can help to improve engine protection and, ultimately, lower maintenance requirements.

### INCREASING OIL STRESS

Although investing in the latest engines to help improve fuel efficiency is attractive, these engines can place increased stress on their lubricating oils.

- Elevated operating temperatures can lead to accelerated degradation of some oils. This increases the risk of deposit formation on the piston undercrown or in the crankcase.
- Smaller sump volumes can lead to rapid base number (BN) depletion and viscosity increase.
- Modern engines can have a low specific lubricating oil consumption (SLOC). For poorer-quality lubricants, this can mean high oil stress and reduced service life.
- The ability to use different fuel types means that lubricants have to cope with a greater variation in fuel quality.

Shell Argina and Shell Gadinia have been fully reformulated with our latest additive technology to cope with these new challenges and are designed to perform under very stressful operating conditions.



**Low consumption; high stress:** Many modern design engines have a low SLOC. This means that the oil has to work harder for longer.



# SOLUTIONS FOR YOUR TECHNICAL NEEDS



- The new Shell Argina and Shell Gadinia product families are built on Shell's understanding of oil stress.
- The oils' "DNA" is underpinned by our rigorous scientific understanding of oil stress.
- Designed to meet the challenges of a wide range of equipment designs and applications, their performance has been proven on the oceans.

## SHELL GADINIA S3 HAS A COMPREHENSIVE SET OF NON-ENGINE APPROVALS, INCLUDING FROM

- Simplex B&V
- Ortlinghaus
- Stromag
- Reintjes
- Renk, Rheine
- Renk, Augsburg
- Siemens/Flender
- MAN Alpha (meets requirements)
- CLP requirement specification (meets requirements widely)
- VDL requirements specification (meets requirements widely).



The **new Shell Argina** and **Shell Gadinia** trunk piston engine oils have been reformulated to help give low oil consumption and good wear protection.

	SHELL ARGINA RANGE Marine propulsion and auxiliary engines with low SLOC and/or burning high-sulphur heavy fuel oil	SHELL GADINIA RANGE Marine propulsion and auxiliary engines burning diesel or other distillate fuels
ADVANCED	<b>Shell Argina S5</b> <ul style="list-style-type: none"> <li>■ Extra protection from deposits and corrosion*</li> <li>■ Extended oil life*</li> <li>■ BN55</li> </ul>	
	<b>Shell Argina S4</b> <ul style="list-style-type: none"> <li>■ Extra protection from deposits and corrosion*</li> <li>■ Extended oil life*</li> <li>■ BN40</li> </ul>	
MAINSTREAM	<b>Shell Argina S3</b> <ul style="list-style-type: none"> <li>■ Protection from deposits and corrosion*</li> <li>■ BN30</li> </ul>	<b>Shell Gadinia S3</b> <ul style="list-style-type: none"> <li>■ Extra protection from deposits and corrosion*</li> <li>■ Wide applicability in non-engine applications*</li> <li>■ BN12</li> </ul>
	<b>Shell Argina S2</b> <ul style="list-style-type: none"> <li>■ Protection from deposits and corrosion</li> <li>■ Suitable for residual, blended and distillate fuels*</li> <li>■ BN20</li> </ul>	

\*Compared with market representative products

### APPLICATION ICON KEY

- Power engines
- Marine applications
- Long life
- Enclosed gears



## SHELL ARGINA S-SERIES AND SHELL GADINIA S3 OILS HAVE SPENT ALMOST 45,000 HOURS (NEARLY FIVE YEARS!) IN FIELD TRIALS.

Their performance has been successfully demonstrated in the field in various engine makes and models:

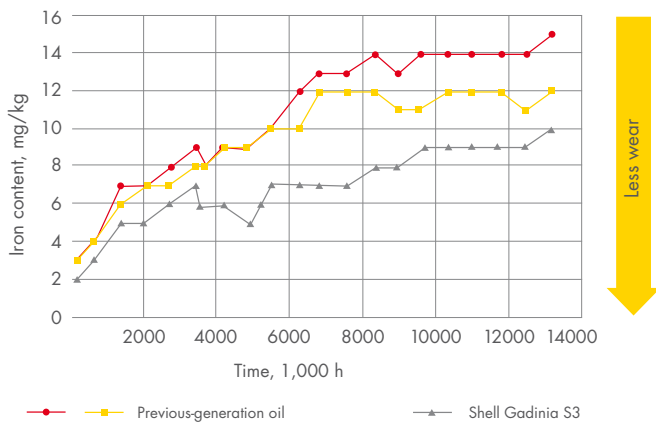
- Wärtsilä 8L20, 8L46D and 20V32
- MAN 8L21/31 and 9L48/60
- Caterpillar MAK 8M20 and MAK 8M43
- Bergen Engines C25:33L6A.



### EXTENDED OIL LIFE

The high brake mean effective pressure in modern engines can cause rapid depletion of an oil's BN and viscosity increase. Shell trunk piston engine oils

- provide excellent BN retention and viscosity control, thereby helping to minimise the need for excessive topping up
- help to reduce oil consumption through longer oil life.



**Cleaner and less wear:** This Wärtsilä 8L20 valve cover is visibly cleaner after 12,000 hours with Shell Gadinia S3 compared with the same time with the previous-generation, anti-lacquer Shell Gadinia products. Used-oil wear metal levels are lower too.



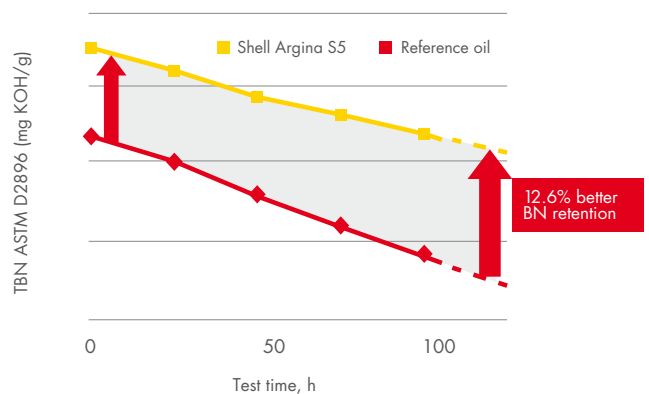
PREVIOUS-GENERATION OIL



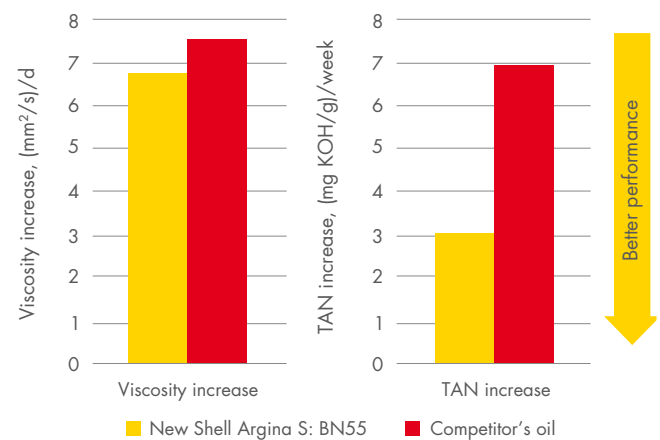
SHELL GADINIA S3

### EFFICIENCY

- Shell Gadinia S3 is designed to help prevent liner lacquering and therefore reduce oil consumption in modern engines.
- Shell Gadinia S3 can help to reduce operational complexity. Approved for a wide range of non-engine shipboard applications such as reduction gears, it provides a single lubricant solution for smaller vessels.



**BN retention:** Shell Argina S5 has 12.6% better BN retention compared with a high-performing industry reference oil (ASTM D2896).



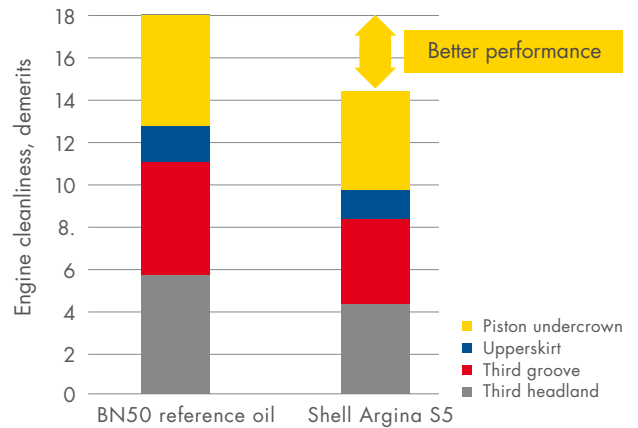
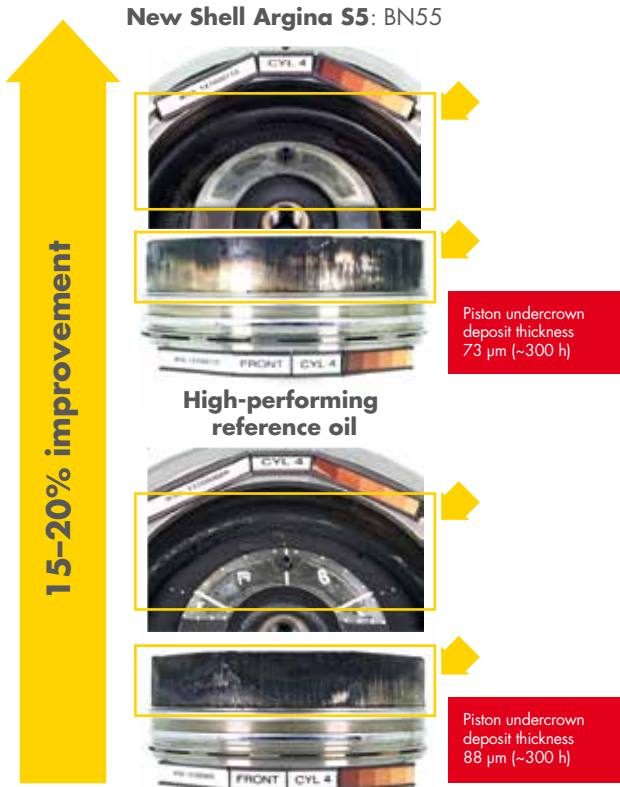
**Longer life:** Shell Argina S5 has improved viscosity control and superior resistance to increasing total acid number (TAN) compared with a high-performing industry reference oil (CAT AVL engine test).



## IMPROVED ENGINE PROTECTION

Deposits can increase the frequency of maintenance and, ultimately, limit vessel availability. The detergent and dispersant additive technologies found in Shell Argina and Shell Gadinia help to keep your engine clean. They can help to reduce maintenance requirements by offering

- improved cleanliness for pistons, piston undercrowns, piston ring belts and crankcases
- longer filter life
- less fuel pump sticking
- improved lacquer control\*.



**Superior cleanliness:** The results of an engine test show the cleaning power of new Shell Argina S5 compared with a high-performance trunk piston engine oil. The single cylinder CAT-AVL test engine ran for 96 hours using 3%-sulphur heavy fuel oil.



## SPECIFICATIONS AND APPROVALS

**SHELL ARGINA AND SHELL GADINIA HAVE APPROVALS FROM**

- MAN Diesel & Turbo
- Wärtsilä
- Caterpillar
- Rolls-Royce.

**Low maintenance:** Shell Argina S5 reduced undercrown deposits by 15-20% compared with a high-performing industry reference oil. Protection against undercrown deposits can help to extend the time between maintenance intervals (tests in Shell's Wärtsilä 4L20D engine run at 100% load for 500 hours with fuel-contaminated oil).

\*Shell Gadinia S3 only



## HELP TO MAXIMISE LUBRICANT VALUE WITH OUR TECHNICAL SERVICES

Through our technical services, we can recommend the right products for your needs, offer flexible training programmes, help to optimise equipment performance, and analyse and diagnose lubricant-related problems.

We offer a suite of technical service programmes that aim to help you overcome operational complexities and reduce your operating costs.

### Shell LubeMonitor 4T

The Shell LubeMonitor 4T service (only applicable to Shell Argina) includes tailored medium-speed-engine oil-stress-management advice designed to help you strike an acceptable balance between engine oil costs and maintenance expenses. As part of the service, we quantify the financial benefits from implementing improvements.

The combination of Shell Argina engine oil and the Shell LubeMonitor 4T service can help to

- increase engine protection and reliability
- optimise operating costs over an engine's life
- provide longer oil life
- provide longer engine component life.

### Shell Rapid Lubricants Analysis

This flexible used-oil analysis service is designed to save you time and money related to equipment failures. It is an early-warning system that aims to give you peace of mind from the knowledge that your equipment and lubricants are working efficiently.

### Shell LubeAdvisor

Through this service, we provide a global team of field-based engineers for on-site support, including lubrication surveys, vessel assessments and in-depth technical and application support, as required. Support is also available by phone and email.

### Shell LubeCoach

This training programme is designed to help you realise the potential benefits of a fully focused lubrication plan and to get maximum return from your investment with a better qualified team.

#### FIND OUT MORE

For more information on our products or their applications, please contact your Shell Marine representative or visit [www.shell.com/marine](http://www.shell.com/marine)

**A DEDICATED TEAM OF TECHNICAL EXPERTS IS READY TO HELP YOU OVERCOME OPERATIONAL COMPLEXITIES BY RECOMMENDING THE RIGHT LUBRICANTS FOR YOUR VESSELS.**